03/07/14 Agenda

- Warm Up

- Section 7.5 day 2 - Rational Exponents & Radicals

- Homework
  - Worksheet 7.5 - Rational Exponents & Radicals
    (1 - 33 odds)

Warm Up - Homework out!

Put your name on a slip of paper.

Simplify:

$4ab^0$ $= 4a \cdot 1 = 4a$

$\frac{3^{-2}}{n^1}$ $= \frac{1}{3^2 n} = \frac{1}{9n}$

$\frac{1}{c^{-1}}$ $\frac{1 \cdot c^1}{1} = c$

$\frac{6^1 a^{-1} c^{-3}}{d^0 = 1}$ $= 6^1 a^{-1} c^{-3} = \frac{6}{ac^3}$

Section 7.5 day 2 - Rational Exponents & Radicals

Target 7A March 7, 2014

Review:

$$a^m a^n = a^{m+n} \qquad \frac{a^m}{a^n} = a^{m-n}$$

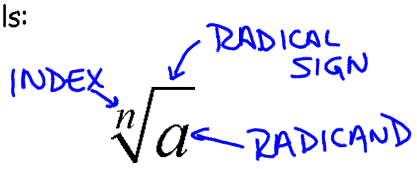
$$(a^m)^n = a^{mn}$$

$$(ab)^m = a^m b^m \qquad \left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$$

$$a^0 = 1 \qquad a^{-n} = \frac{1}{a^n} \qquad \frac{1}{a^{-n}} = a^n$$

Definitions:

Radicals:



The index gives the 'degree' of the root.

For a cube root, the degree is 3 $\sqrt[3]{x}$

$\sqrt{\ }$

When no index is written, assume the index is 2.

This is usually called the SQUARE ROOT.

$5^2 = 25 \qquad \sqrt{25} = \sqrt{5 \cdot 5} = 5$

$\sqrt[2]{5^2}$

$25^{\frac{1}{2}} = 5$

$\sqrt[2]{25} = 25^{\frac{1}{2}} = 5$

$\sqrt[3]{8} = 8^{\frac{1}{3}} \qquad 625^{\frac{1}{4}} = \sqrt[4]{625}$

There are 2 ways to simplify: $\sqrt[3]{5^3}$

1.) $\sqrt[3]{125} = \sqrt[3]{5 \cdot 5 \cdot 5} = 5$

$5 \cdot 25$

$5 \cdot 5$

2) $\sqrt[4]{2^4}$

$\sqrt[4]{16} = 16^{\frac{1}{4}}$

$4 \cdot 4$

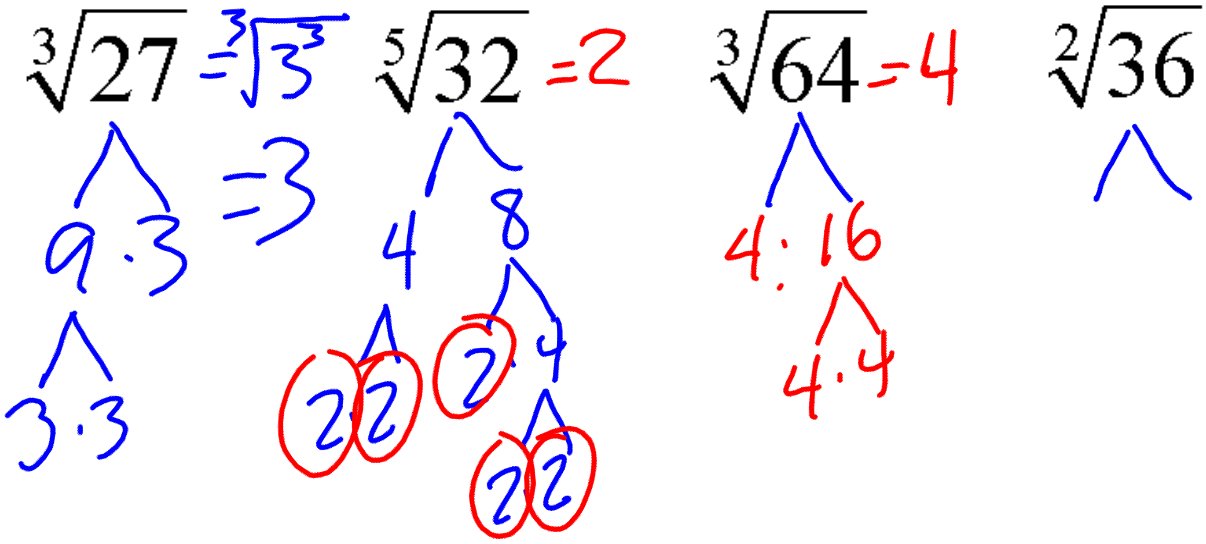
$= (2 \cdot 2 \cdot 2 \cdot 2)^{\frac{1}{4}}$

$2 \cdot 2 \cdot 2 \cdot 2$

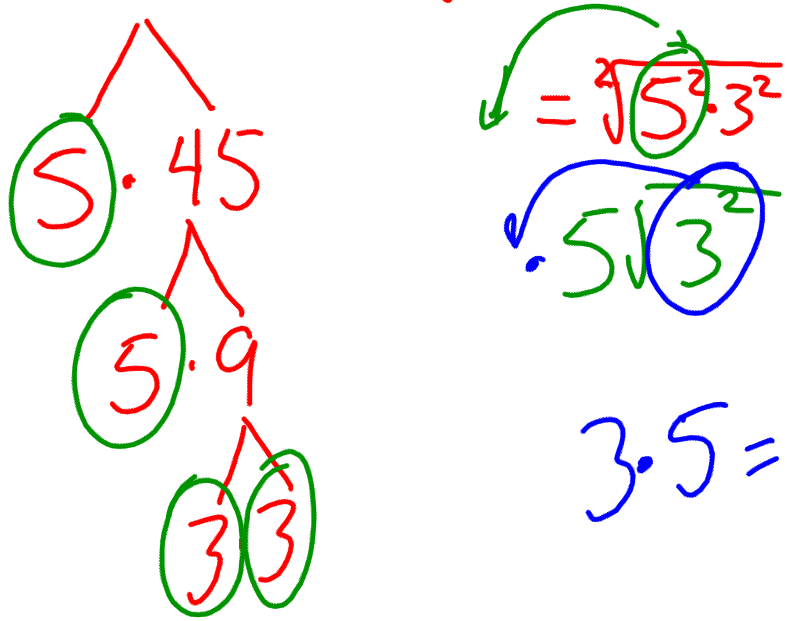
$= 2$

You try:

$\sqrt[3]{27}$ $\sqrt[3]{3^3}$ $\sqrt[5]{32}$ $\sqrt[3]{64}$ $\sqrt[2]{36}$



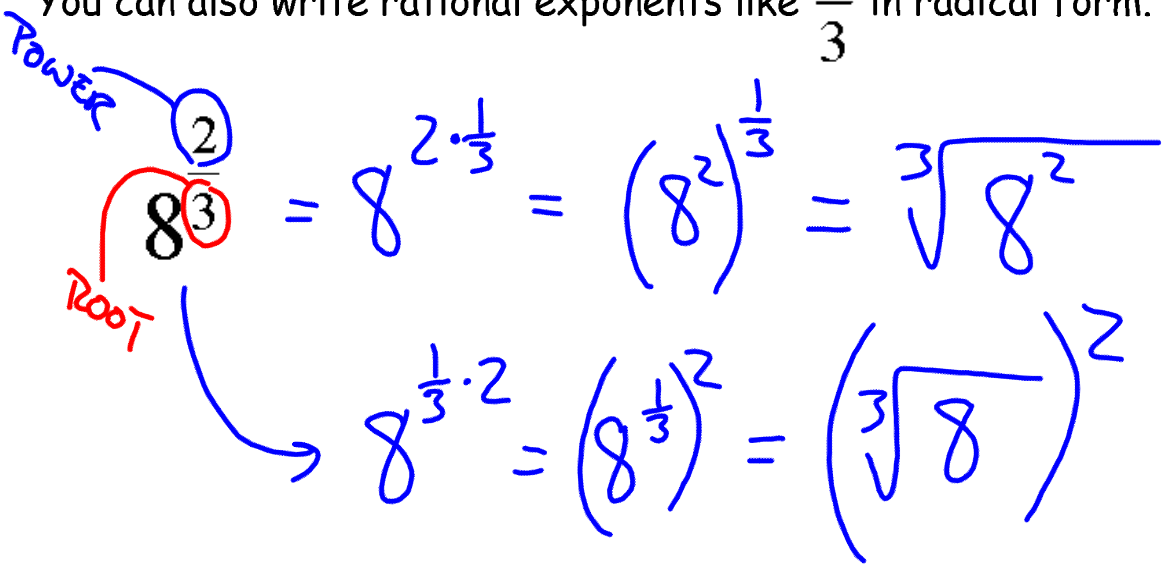
$\sqrt{225}$ $= \sqrt{5 \cdot 5 \cdot 3 \cdot 3}$



$3 \cdot 5 = 15$

$\sqrt{625}$

You can also write rational exponents like $\frac{2}{3}$ in radical form.



So: $$a^{\frac{1}{n}} = \sqrt[n]{a}$$

and

$$a^{\frac{m}{n}} = \sqrt[n]{a^m} = \left(\sqrt[n]{a}\right)^m$$

Section 7.5 day 2 - Rational Exponents & Radicals

Target 7A March 7, 2014

Re-write the following multiplication of radicals using exponents then simplify:

$\sqrt{x} \cdot \sqrt{x} =$ $x^{\frac{1}{2}} \cdot x^{\frac{1}{2}} = x^{\frac{1}{2}+\frac{1}{2}} = x^1 = x$

$\sqrt[4]{y} \cdot \sqrt[4]{y} \cdot \sqrt[4]{y} \cdot \sqrt[4]{y} =$ y

$\sqrt[3]{5} \cdot \sqrt[3]{5} \cdot \sqrt[3]{5} =$ $5^{\frac{1}{3}} \cdot 5^{\frac{1}{3}} \cdot 5^{\frac{1}{3}} = 5^{\frac{1}{3}+\frac{1}{3}+\frac{1}{3}}$

$5^1 = 5$

Write each expression in radical form or exponential form, then simplify:

$b^{\frac{5}{3}} = \sqrt[3]{b^5}$ $h^{\frac{2}{5}} = \sqrt[5]{h^2}$

$(16b^2)^{\frac{3}{2}}$ $\sqrt{(16b^2)^3}$

$\sqrt{16^3 b^6}$

$\sqrt{16 \cdot 16 \cdot 16 \cdot b^2 \cdot b^2 \cdot b^2}$

$4 \cdot 4 \cdot 4 \cdot b \cdot b \cdot b$

$27^{\frac{4}{3}} = \sqrt[3]{27^4}$

$= 3^4 = 81$

$\sqrt[5]{a^7} = a^{\frac{7}{5}}$ $\sqrt[3]{8c^5} = 8^{\frac{1}{3}} c^{\frac{5}{3}}$

$= 2c^{\frac{5}{3}}$

$\left(\sqrt{64}\right)^3$

$\left(64^{\frac{1}{2}}\right)^3 = 64^{\frac{3}{2}}$

$b^{\frac{1}{3}}(ab)^{\frac{1}{2}}$

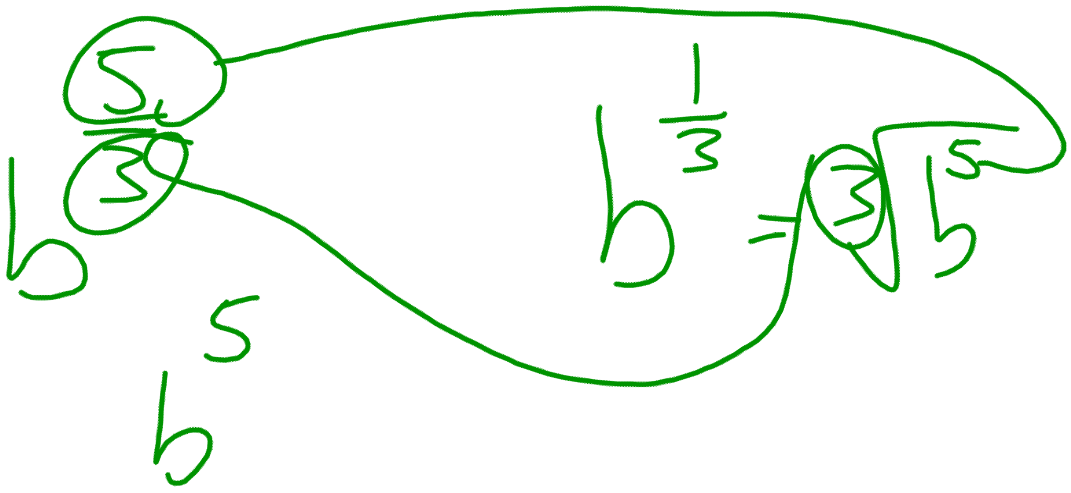
$b^{\frac{1}{3}} \cdot a^{\frac{1}{2}} \cdot b^{\frac{1}{2}}$

$a^{\frac{1}{2}} \cdot b^{\frac{1}{3}+\frac{1}{2}}$

$a^{\frac{1}{2}} \cdot b^{\frac{2}{6}+\frac{3}{6}} = a^{\frac{1}{2}} b^{\frac{5}{6}}$

$a^{\frac{3}{6}} b^{\frac{5}{6}}$

$\sqrt[6]{a^3 b^5}$


5
3
b
5
b
1
3
b
=
3
5
b